

In The Claims:

1. (Currently amended) A method of providing improved quality of service over a series of related messages exchanged between computers in a networking environment, comprising ~~steps of~~:

determining one or more transactional quality of service ("TQoS") values to be applied to the related messages;

using the determined TQoS values ~~to transmit~~ when transmitting at least one of the related messages for delivery to a particular one of the computers; ~~and~~

annotating selected ones of the related messages with information reflecting the determined ~~TQoS~~ TQoS values; ~~and~~

transmitting the annotated ones of the related messages with the information reflecting the determined TQoS values to the particular computer.

2. (Original) The method according to claim 1, wherein one of the TQoS values is a transmission priority value to be used when transmitting the annotated messages.

3. (Original) The method according to claim 1, wherein one of the TQoS values is available bandwidth information pertaining to a network connection to the particular computer.

4. (Currently amended) The method according to claim 1, further comprising ~~the step of~~ storing the determined TQoS values for use when transmitting subsequent ones of the related messages to the particular computer.

5. (Currently amended) The method according to claim 1, wherein the particular computer is a client computer, and transmitting the annotated ones of the related messages with the information reflecting the determined TQoS values to the particular computer comprises transmitting the related messages from a server computer to the client computer, and the using

~~step transmits one of the annotated messages to the client computer, and further comprising steps of:~~

receiving the transmitted annotated ~~message~~ messages at the client computer; and
transmitting the TQoS values from the client computer to the server computer with
subsequent ones of the related messages ~~automatically returning the TQoS values to a server~~
~~computer in each subsequent one of the related messages.~~

6. (Currently amended) The method according to claim 5, wherein:
~~the transmitted annotated message includes~~ annotated messages transmitted from the
server computer to the client computer comprise an object reference that is annotated to carry the
TQoS values[[,]]; and ~~wherein~~

transmitting the TQoS values from the client computer to the server computer with
subsequent ones of the related messages comprises ~~the~~ automatically returning the TQoS values
to the server computer with subsequent ones of the related messages based on ~~step is enabled by~~
the annotation of the object reference in a related message that is received from the server
computer.

7. (Original) The method according to claim 1, wherein at least one of the annotated
messages is a response that serves a Web page to the particular computer.

8. (Original) The method according to claim 1, wherein at least one of the annotated
messages is a request from the particular computer for a Web page.

9. (Original) The method according to claim 1, wherein at least one of the annotated
messages is a request from the particular computer for a Web object.

10. (Original) The method according to claim 5, wherein at least one of the annotated
messages is a response that serves a Web page to the particular computer and wherein at least

one of the subsequent ones of the related messages is a request for information referenced by the Web page.

11. (Original) The method according to claim 5, wherein at least one of the annotated messages is a response that serves a Web page to the particular computer and wherein at least one of the subsequent ones of the related messages is a request for information selected from the Web page by a user of the particular computer.

12. (Currently amended) The method according to claim 1, wherein ~~the using step~~ using the determined TQoS values when transmitting at least one of the related messages for delivery to a particular one of the computers further comprises using the determined TQoS values to set markings in a network layer header of the transmitted annotated messages.

13. (Currently amended) The method according to claim 3, further comprising ~~the step of~~ enforcing bandwidth allocation using the available bandwidth information as the at least one transmitted message is transmitted through the networking environment.

14. (Currently amended) The method according to claim 2, further comprising ~~the step of~~ using the transmission priority value to prioritize the transmission of the at least one transmitted message through the networking environment.

15. (Currently amended) The method according to claim 4, wherein ~~the storing step~~ stores storing the determined TQoS values for use when transmitting subsequent ones of the related messages to the particular computer comprises storing the determined TQoS values in a server computer.

16. (Currently amended) The method according to claim 2 ~~or claim 3~~, wherein ~~the annotating step~~ annotating selected ones of the related messages with information reflecting the

determined TQoS values further comprises storing the information reflecting the determined TQoS values as part of a routing token in the annotated messages.

17. (Original) The method according to claim 16, wherein the routing token is used to modify a Uniform Resource Locator from a header of selected ones of the related messages.

18. (Currently amended) The method according to claim 17, wherein the routing token further comprises information enabling identification of the particular computer and another computer which performs the transmitting step, as well as identification of a storage area used to store the determined TQoS values for the related messages.

19. (Currently amended) A system for providing improved quality of service over a series of related messages exchanged between computers in a networking environment, comprising:

means for determining one or more transactional quality of service ("TQoS") values to be applied to the related messages;

means for using the determined TQoS values ~~to transmit~~ when transmitting at least one of the related messages for delivery to a particular one of the computers; ~~and~~

means for annotating selected ones of the related messages with information reflecting the determined TQoS values; and

means for transmitting the annotated ones of the related messages with the information reflecting the determined TQoS values to the particular computer.

20. (Original) The system according to claim 19, wherein the TQoS values comprise one or more of (1) a transmission priority value to be used when transmitting the annotated messages and (2) available bandwidth information pertaining to a network connection to the particular computer.

21. (Original) The system according to claim 19, further comprising means for storing the determined TQoS values for use when transmitting subsequent ones of the related messages to the particular computer.

22. (Currently amended) The system according to claim 19, wherein the particular computer is a client computer and wherein the means for using the determined TQoS values transmits ~~one of the annotated messages~~ the related messages from a server computer to the client computer, and further comprising:

means for receiving the transmitted annotated ~~message~~ messages at the client computer;
and

means for transmitting the TQoS values from the client computer to the server computer with subsequent ones of the related messages ~~automatically returning the TQoS values to a server computer in each subsequent one of the related messages.~~

23. (Currently amended) The system according to claim 22, wherein the ~~transmitted~~ annotated ~~message~~ messages transmitted from the server computer to the client computer comprises ~~includes~~ an object reference that is annotated to carry the TQoS values, and wherein the means for transmitting the TQoS values from the client computer to the server computer is configured to ~~automatically returning is enabled by~~ return the TQoS values to the server computer with subsequent ones of the related messages based on the annotation of the object reference.

24. (Original) The system according to claim 19, wherein at least one of the annotated messages is a response that serves a Web page to the particular computer, a request from the particular computer for a Web page, or a request from the particular computer for a Web object.

25. (Original) The system according to claim 22, wherein at least one of the annotated messages is a response that serves a Web page to the particular computer and wherein at least

one of the subsequent ones of the related messages is a request for information referenced by the Web page.

26. (Original) The system according to claim 22, wherein at least one of the annotated messages is a response that serves a Web page to the particular computer and wherein at least one of the subsequent ones of the related messages is a request for information selected from the served Web page by a user of the particular computer.

27. (Original) The system according to claim 19, wherein the means for using the determined TQoS values further comprises using the determined TQoS values to set markings in a network layer header of the transmitted annotated messages.

28. (Original) The system according to claim 20, further comprising means for enforcing bandwidth allocation using the available bandwidth information as the at least one transmitted message is transmitted through the networking environment.

29. (Original) The system according to claim 20, further comprising means for using the transmission priority value to prioritize the transmission of the at least one transmitted message through the networking environment.

30. (Original) The system according to claim 21, wherein the means for storing stores the determined TQoS values in a server computer.

31. (Original) The system according to claim 20, wherein the means for annotating further comprises means for storing the information reflecting the determined TQoS values as part of a routing token in the annotated messages.

32. (Original) The system according to claim 31, wherein the routing token is used to

modify a Uniform Resource Locator from a header of selected ones of the related messages.

33. (Original) The system according to claim 32, wherein the routing token further comprises information enabling identification of the particular computer and another computer which performs the means for transmitting, as well as identification of a storage area used to store the determined TQoS values for the related messages.

34. (Original) The system according to claim 22, wherein:
the TQoS values comprise at least (1) a transmission priority value to be used when transmitting the annotated messages and (2) available bandwidth information pertaining to a network connection to the particular computer; and

at least one of the annotated messages is a response that serves a Web object to the particular computer from a network cache; and

wherein the means for using the determined TQoS values further comprises using the determined TQoS values, by the network cache, to prioritize transmission of the response that serves the Web object and to enforce bandwidth allocation using the available bandwidth information as the response is transmitted.

35. (Currently amended) A system for providing improved quality of service for transmission of related request and response messages exchanged between computers in a networking environment, comprising:

means for determining one or more quality of service ("QoS") values to be applied to transmission of the related messages; and

means for communicating the QoS values to be applied to the transmission by storing the determined QoS values in headers of selected ones of the request and response messages and transmitting the request and response messages with the headers containing the determined QoS values to a particular computer.

36. (Original) The system according to claim 35, wherein the determined QoS values are stored as cookies in the headers.

37. (Currently amended) A computer program product for providing improved quality of service over a series of related messages exchanged between computers in a networking environment, the computer program product embodied on one or more computer-readable media and comprising:

computer-readable program code ~~means for determining~~ that is configured to determine one or more transactional quality of service ("TQoS") values to be applied to the related messages;

computer-readable program code ~~means for using~~ that is configured to use the determined TQoS values ~~to transmit~~ when transmitting at least one of the related messages for delivery to a particular one of the computers; and

computer-readable program code ~~means for annotating~~ that is configured to annotate selected ones of the related messages with information reflecting the determined TQoS values; and

computer-readable program code that is configured to transmit the annotated ones of the related messages with the information reflecting the determined TQoS values to the particular computer.

38. (Original) The computer program product according to claim 37, wherein the TQoS values comprise one or more of (1) a transmission priority value to be used when transmitting the annotated messages and (2) available bandwidth information pertaining to a network connection to the particular computer.

39. (Currently amended) The computer program product according to claim 37, further comprising computer-readable program code ~~means for storing~~ that is configured to store the determined TQoS values for use when transmitting subsequent ones of the related messages

to the particular computer.

40. (Currently amended) The computer program product according to claim 37, wherein the particular computer is a client computer, and wherein the computer-readable program code that is configured to transmit the annotated ones of the related messages is configured to transmit the messages from a server computer to the client computer~~the computer-readable program code means for using the determined TQoS values transmits one of the annotated messages to the client computer~~, and further comprising:

computer-readable program code ~~means for receiving~~ that is configured to receive the transmitted annotated ~~message~~ messages at the client computer; and

computer-readable program code that is configured to transmit the TQoS values from the client computer to the server computer with subsequent ones of the related messages~~means for automatically returning the TQoS values to a server computer in each subsequent one of the related messages~~.

41. (Currently Amended) The computer program product according to claim 40, wherein the ~~transmitted annotated message includes~~ annotated messages transmitted from the server computer to the client computer include an object reference that is annotated to carry the TQoS values, and wherein the computer-readable program code that is configured to transmit the TQoS values from the client computer to the server computer with subsequent ones of the related messages is configured to automatically return the TQoS values to the server computer with subsequent ones of the related messages based on the annotation of the object reference in a related message that is received from the server computer~~means for automatically returning is enabled by the annotation of the object reference~~.

42. (Original) The computer program product according to claim 37, wherein at least one of the annotated messages is a response that serves a Web page to the particular computer, a request from the particular computer for a Web page, or a request from the particular computer

for a Web object.

43. (Original) The computer program product according to claim 40, wherein at least one of the annotated messages is a response that serves a Web page to the particular computer and wherein at least one of the subsequent ones of the related messages is a request for information referenced by the Web page.

44. (Original) The computer program product according to claim 40, wherein at least one of the annotated messages is a response that serves a Web page to the particular computer and wherein at least one of the subsequent ones of the related messages is a request for information selected from the served Web page by a user of the particular computer.

45. (Currently amended) The computer program product according to claim 37, wherein the computer-readable program code ~~means for using means for using~~ that is configured to use the determined TQoS values ~~further comprises using~~ is further configured to use the determined TQoS values to set markings in a network layer header of the transmitted annotated messages.

46. (Currently amended) The computer program product according to claim 38, further comprising computer-readable program code ~~means for enforcing~~ that is configured to enforce bandwidth allocation using the available bandwidth information as the at least one transmitted message is transmitted through the networking environment.

47. (Currently amended) The computer program product according to claim 38, further comprising computer-readable program code ~~means for using~~ that is configured to use the transmission priority value to prioritize the transmission of the at least one transmitted message through the networking environment.

48. (Currently amended) The computer program product according to claim 39, wherein the computer-readable program code ~~means for storing~~ stores that is configured to store the determined TQoS values in a server computer.

49. (Currently amended) The computer program product according to claim 38, wherein the computer-readable program code ~~means for annotating~~ that is configured to annotate further comprises computer-readable program code ~~means for storing~~ that is configured to store the information reflecting the determined TQoS values as part of a routing token in the annotated messages.

50. (Original) The computer program product according to claim 49, wherein the routing token is used to modify a Uniform Resource Locator from a header of selected ones of the related messages.

51. (Original) The computer program product according to claim 48, wherein the routing token further comprises information enabling identification of the particular computer and another computer which performs the computer-readable program code that is configured to transmit ~~means for transmitting~~, as well as identification of a storage area used to store the determined TQoS values for the related messages.

51. (New) The method according to claim 5, further comprising storing the TQoS values as one or more cookies on the client computer.

52. (New) The method according to claim 51, wherein transmitting the TQoS values from the client computer to the server computer with subsequent ones of the related messages comprises determining the TQoS values to be transmitted from the client computer based on the stored one or more cookies on the client computer.

53. (New) The system according to claim 22, further comprising means for storing the TQoS values received at the client computer as one or more cookies on the client computer.

54. (New) The system according to claim 53, wherein the means for transmitting the TQoS values from the client computer to the server computer with subsequent ones of the related messages comprises means for determining the TQoS values to be transmitted from the client computer based on the stored one or more cookies on the client computer.

55. (New) The computer program product according to claim 40; further comprising computer-readable program code that is configured to store the TQoS values that are received at the client computer as one or more cookies on the client computer.

56. (New) The computer program product according to claim 55, wherein the computer-readable program code that is configured to transmit the TQoS values from the client computer to the server computer with subsequent ones of the related messages is further configured to determine the TQoS values to be transmitted from the client computer based on the stored one or more cookies on the client computer.